

POSTURE STATEMENT BY
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Mr. Chairman, distinguished Members, it is an honor to appear before you to address issues related to the interface between the intelligence and scientific communities and the potential benefit to be gained by bringing these communities more closely together to address biological threats to the nation. I am currently Vice President and Chief Biological Scientist at the Midwest Research Institute in Kansas City, Director of the National Agriculture Biosecurity Center at Kansas State University and Senior Fellow for Bioterrorism at the Combating Terrorism Center at West Point. I served on active duty in the U.S. Army from 1971 to 1998, 24 of those years in the U.S. Army Medical Research and Materiel Command. I served for 11 years at the U.S. Army Medical Research Institute of Infectious Disease, which I commanded before my retirement. During my tour of duty at USAMRIID, I served as Chief Inspector on three UNSCOM biological warfare missions to Iraq and as technical expert on the Trilateral (US-UK-Russia) Agreement visits and negotiations to Russia. I have worked under the auspices of the “Nunn-Lugar” Cooperative Threat Reduction (CTR) Program in the Former Soviet Union (FSU) since 1994 and, since 1998, chaired the National Academies of Science standing committee which provides technical review to the CTR-supported research conducted there. I currently serve on senior S&T advisory biodefense panels for the Defense Threat Reduction Agency and for the Department of Homeland Security, Science and Technology Directorate and I chair the Working Group on International Collaboration of the National Science Advisory Board for Biosecurity (NSABB) within the Department of Health and Human Services. The myriad opportunities given me throughout my career in military medical research have led me to better understand and value the use of science as a common language to build relationships, understanding and transparency internationally.

This committee has asked that I provide thoughts on how the scientific community can be more effectively engaged by the intelligence community and some broad perspective on how to address the problem of intelligence regarding the biological threat(s). I have attempted to provide my views on a number of these issues below.

BACKGROUND:

Why is biology special? I believe that biological warfare is unique for several reasons. First, the **facilities, equipment, procedures and human resources needed are “dual-use”**. This means that they can be used to do good or bad things with biology. When attempting to understand what is going on within a

state scientific program or the laboratory of a non-state organization, understanding the intent of those who control these dual-use resources is more important than our access to the facilities. It is, in fact, often impossible to understand the ultimate purpose of ongoing research simply by ‘inspecting’ a facility and even having the opportunity for typically-orchestrated, monitored and, therefore, stilted discussion with the scientists. Additionally, biology is special because, in contrast to a chemical attack, for example, we **cannot yet provide real-time warning** to effectively use personal protective gear. Thirdly, clinical disease resulting from biological exposure occurs hours or days after attack. Unlike most other weapons systems, the relatively **long latent period between attack and illness** provides opportunity for perpetrators to escape and greatly complicates both the medical care of victims and law enforcement activities.

Lessons from the cold war: We learned relatively very little about the enormous biological warfare program of the FSU before the epidemiological studies of the 1979 Sverdlosk anthrax accident and the defection of two key scientists to the west which occurred in the early 90s. Our intelligence failure may have been the result of a combination of the uniqueness of biology and a relatively lower concern for the biological threat than for the nuclear or chemical threats during those years. Coincidentally, there was much more interaction between nuclear scientists from the USSR and the US during this period than there was between biological scientists from the two countries...and we understood their nuclear program better during that period. At the end of the cold war, as a result of the Trilateral agreement of 1992, we gained some access to Russian biological facilities but very little true understanding of the programs. Confidently inferring intent from a formal facilities visit or inspection was the exception. More importantly, I watched as those negotiations built walls of silence and suspicion and shut down communication...until the Trilateral negotiations failed and Nunn-Lugar science-based programs opened dialogue directly between scientists. The CTR programs haven’t made us totally safe, but they helped both sides understand better what we did and didn’t know. In my experience, more good has come from the resulting personal relationships build around the science than from formal government programs calculated to control proliferation. There are important lessons to be learned from this experience.

Biological Warfare vs. Biological Terrorism: Dealing with the massive offensive biological programs of the FSU, frustrating as the process was during the “Trilateral Era”, will likely prove to have been easier than what we will face in the future. Biological terrorism differs from biological warfare in that 1) the footprint of both a production capability and the biological weapon itself can be infinitely

smaller and 2) attribution will typically be a great deal more difficult. Finally, we need only look to the “anthrax letters of ‘01” to see how disruptive and costly a very small attack can be.

How to think about the threat: Today’s threat probably differs significantly from that during the height of the USSR’s massive offensive program. Because of strategic changes in centers of power and world politics, terrorists are believed to be a more likely threat than state-run programs. Whether state-sponsored or not, the magnitude of an aerosol attack launched by a terrorist group will likely be smaller and more primitive than what we would have expected from the USSR. We normally consider access to the agents, technical expertise, the need for facilities and equipment and the intention to use biology as a weapon as the key barriers to success for the would-be terrorist. Depending on the agent selected, I believe that disruptive deployment of a **biological attack of some kind is possible for almost anyone with intent**. To illustrate this point—the spectrum from “easy” to “hard”--- I often use the following simplified model. Success on the “easy” end of the spectrum requires just a little more than intent.

Easy <-----		-----> Difficult	
Few Technical Barriers		Many Technical Barriers	
Highly Contagious (Animal) (Foot & Mouth Virus)	Contagious (Human) (SARS, Flu, Smallpox)	Traditional Agent (Anthrax, tularemia)	Genetically engineered (???????)
Simply Introduced	Introduced or Aerosol	Delivered as an Aerosol	Introduced or Aerosol
Available	(Available)	Available in Nature	Modified or de novo
Spread Naturally	Spread Naturally	Understanding	Significant Expertise
Safe to handle	Safety Hazard	Basic Equipment	Complex Equipment
		Safety Hazard	Unknown Safety Hazard

Therefore, there is a broad range of potential threats presenting minimal to very significant technical barriers for the would-be terrorist...but intent is central to any attempt to abuse biology.

CONCLUSIONS:

What does all this mean for the intelligence community?

1-Although we definitely cannot ignore Soviet or Iraqi- like programs in the future, we must be able to discover a terrorist-size program now, if possible at the point of early intent.

2-The biological intelligence target of today will likely be harder to identify, let alone penetrate, than it was during the cold war.

3-What we learn about ‘intent’ will be more valuable than what we know about capability.

4-Even in this new, small world, we will be forced to make high-regret decisions or responses with less information in the future than in the past.

5-A “we only collect secrets” culture, sometimes fostered within the IC, will leave too much white space between the dots to build the real story regarding biology, unless we have a broad framework of scientific understanding on which to pin the relatively few science “secrets” which we do discover.

6-We must constantly strive to bring deep biological science understanding to the community. Analysts need to learn of the latest discoveries in biology, understand the newest technologies and appreciate their implications for intentional abuse.

RECOMMENDATIONS:

What can we do? As in any undertaking, the best people with the best leadership will provide the best outcome to this challenge. We must put the best people we can into the intelligence community and give them the best leadership and supporting infrastructure we can afford.

We must:

1. Hire and retain the best: The cultures of science and intelligence are, in many ways, antithetical. **Science is about** communication, collaboration, openness and flexible work schedules. Scientists love to publish and they love to tell people about their work. The currency of science is open, refereed publications and presentations at national and international meetings. Scientists are free to publish in journals and, once accepted, their work is forever credited to them. Scientists care more about discovery and publishing than about salary, fancy offices or in what part of the country or world they live. Scientists love to communicate with other scientists. **Intelligence is about** sensitive or classified information, about working with another’s data and publications, about not sharing and not getting credit for one’s analysis and thought...at least not widely. A common task of the analyst might be to distill and simplify, often dated, often openly published literature and then to make giant leaps of interpretation regarding its meaning in unknown context...and then to speculate on the intent of a person or group. A “we only collect secrets” mentality—especially in the world of bioterrorism---might provide us historical intelligence but probably not actionable intelligence. A culture where knowledge is power, openness is not advocated and there are few checks and balances can draw second rate scientists who package speculation as hard evidence. Even the initial excitement of directly briefing key national decision makers gets old for real scientists. When we do succeed in hiring first-rate scientists into the IC (intelligence community), they too often become

disenchanted with their work and the culture. We must find a way to hire and retain a quality, scientifically literate intelligence workforce. Traditionally, the community has put analyst expertise before science expertise; if that policy is to continue, every effort must be made to give biodefense analysts opportunities to interact with scientists, engineers and other relevant experts just as often as possible.

We might:

1-Encourage analysts to obtain joint appointments at universities or industrial research programs and collaborate with full-time scientists.

2-Allow analysts to spend as much as 1/3 of their time “off the clock”, working in academe, industry or other governmental laboratories...and make publication a part of their performance plan on which they are rated. In some cases, this might mean 2 days per week away from the job and in others it might be every third year away.

3-Develop true joint-appointment programs in which an academic or industrial scientist serves the smaller portion of a FTE within the IC with a primary career outside.

Fundamentally, it is much more critical today than during the cold war that the analyst continually interacts with the community of scientists, outside the IC. A non- or weak-scientist, analyst or collector briefed by scientists and sent into the scientific culture will fail to engage and learn. The stronger the scientist, the better the engagement, the understanding and the trust...and the transparency.

Making the best and the brightest interested scientists available to our analyst community has value. The DIA Red Team 20/20, on which both Dr. Relman and I serve, has demonstrated the enormous value of bringing together the security and the scientific communities. Dr. Relman and four or five exceptional colleagues from academe provide the rest of us a wealth of hard science against which we can evaluate our thoughts and concerns. Even in this setting, although the members of this committee are all US citizens and have common goals regarding understanding future threats to our nation, it took several years to build a sense of ‘team’ in this diverse group. The glue was, and is, the science.

2. Attempt to benefit from the experience and perspective of the private sector: Biotechnologies are both changing rapidly and spreading with broad and diverse application—across disciplines--- around the globe. Electronic communication, ease of rapid travel, new opportunities for free enterprise and a generally more widespread openness in formerly closed societies have greatly

increased integration and human interaction among scientists and business persons worldwide. These travelers, together, cast a much wider net than can ever be formally assembled by our government. We should seek opportunities for these traveling masses to provide interaction and feedback to the community on what's "out there" in terms of technologies and capabilities. Discoveries and observations, regarding intent, gained from the private sector will obviously occur much more often by chance than by design, but the numbers and coverage could make it a very helpful tool, if we can harness it effectively. It is important that the intelligence community---or possibly the law enforcement agency to which someone might report an unusual incident---remain passive receptors of information from the private sector. Gaining such information from scientists, clinicians and other knowledgeable individual traveler-citizens is a slippery slope; abuse will do much more harm than good.

We should:

1-Encourage, not discourage, interactions between U.S. science and business and their counterparts around the world.

2-Sensitize this community, or parts of it, to the importance of informing **someone**, should they observe or hear of what appears to be malevolent intent. Education of the masses of scientists and biotechnology business person will have to occur indirectly, raising general awareness of the importance of controlling the misuse of biology, rather than tasking them to "hunt for bioterrorists". Activities currently underway by non-governmental organizations, the National Academies of Science and even the World Health Organization, to educate and develop awareness regarding the misuse of biotechnology, (See "Biotechnology Research in an Age of Terrorism" @ www.nap.edu) may contribute to developing awareness that could result in gaining information from unlikely sources.

3-Outside the intelligence community, work together internationally on common, difficult problems in biology; leads to understanding, transparency and even trust that cannot be achieved through other means (See "Biological Science and Biotechnology in Russia: Controlling Disease and Enhancing Security" @ www.nap.edu). Chronic and emerging disease will be with us when the last bioterrorist retires. Working with colleagues to fight natural disease brings us into contact with biological activities and builds our network of trusted contacts around the world. Even in countries which are known to pose a threat to our biological security, more scientists and clinicians share our goals regarding health than share the goals of the would-be bioterrorist regarding the abuse of biology.

4-Understand that the intelligence community is just one of the tools we have to protect our citizens from those who would harm them. We must, obviously, conduct classified defense and intelligence programs to help protect us

from threat states or groups and we must deal from a position of strength in this very dangerous world. However, we must remember that in the new, smaller world, perception is an extremely powerful tool and the masses of non-terrorists out there can, indirectly, help us fight this war on terrorism, if they think positively of America. Therefore, we must not only allow, but encourage and support, public health and other programs that both improve human security but build understanding, some trust and some transparency between individual Americans and individual citizens of other nations. Walls around our nation, be they of chain-link or invisible, will not necessarily make us safer anymore.

The Power of a Common Language: A reasonable analogy to the problem we face, in preparing an IC workforce to deal with a science as squishy as biology, is foreign language qualification for regional studies. The better my French, the richer will be my experience on a holiday in France and the more the French people will enjoy interacting with me. **Science is a common language;** the better my understanding of the technologies, the vocabulary and the idiom, the richer will be my experience “talking science” anywhere in the world and the more my colleagues will enjoy our time together. When scientists talk about science, intent often becomes better understood...and intent is the key to discovering those who would misuse biology.